



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
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Seattle, WA 98115

NMFS Tracking No.:
2003/00808

November 3, 2003

Greg Yuncevich
Field Manager
Cottonwood Field Office
Route 3, Box 181
Cottonwood, Idaho 83522-9498

RE: Endangered Species Act Section 7 Consultation: Final Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Consultation for the East Fork John Day Culverts and Restoration (3 Projects)

Dear Mr. Yuncevich,

This document transmits the NOAA's National Marine Fisheries Service (NOAA Fisheries) biological opinion (Opinion) for the Bureau of Land Management's (BLM) East Fork John Day Culvert and Restoration Project on the Cottonwood Resource Area. The Opinion is based on NOAA Fisheries' review of the proposed projects and their effects on Snake River steelhead (*Oncorhynchus mykiss*) in accordance with the Endangered Species Act (ESA), and the projects' effects on Essential Fish Habitat (EFH) for chinook salmon, in accordance with the Magnuson-Stevens Act (MSA). Formal ESA consultation is conducted under the authority of section 7(a)(2) of the ESA and its implementing regulations, 50 CFR Part 402. The EFH consultation is conducted under the authority of section 305 (b)(2) of the MSA and its implementing regulations, 50 CFR Part 600.

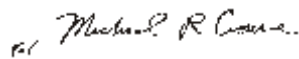
The BLM determined in their June 23, 2003, biological assessment (BA) for the East Fork John Day project that the proposed actions were likely to adversely affect listed Snake River steelhead, not likely to adversely affect spring/summer chinook salmon (*Oncorhynchus tshawytscha*), and have no effect on EFH for chinook salmon. This Opinion is based on information provided by the BLM in the BA, and on literature cited in the Opinion. The enclosed document includes analysis supporting NOAA Fisheries' section 7 determination and an incidental take statement for the proposed actions. Through this letter, NOAA Fisheries concurs with the BLM's finding of not likely to adversely affect chinook salmon.



Pursuant to ESA consultation, NOAA Fisheries concludes that the proposed projects are not likely to jeopardize the continued existence of Snake River steelhead. Please note that this Opinion includes Reasonable and Prudent Measures to avoid or minimize take, and mandatory Terms and Conditions to implement those measures. Pursuant to EFH consultation, NOAA Fisheries concludes that the proposed projects would have no effect on EFH for chinook salmon.

If you have any questions, please contact Bob Ries at (208) 882-6148 or Dale Brege at (208) 983-3859.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael R. Lohn".

D. Robert Lohn
Regional Administrator

Enclosure

cc: J. Foss - USFWS
J. Hansen - IDFG
R. Eichsteadt -NPT

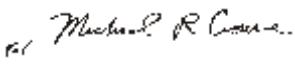
Endangered Species Act Section 7 Consultation Biological Opinion
and
Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

East Fork John Day Creek Culvert Replacement and Stream Restoration Project
Snake River Steelhead
East Fork John Day Creek
170602090301
Idaho County, Idaho

Lead Action Agency: Bureau of Land Management

Consultation Conducted By: NOAA's National Marine Fisheries Service (NOAA Fisheries)
Northwest Region (NWR)

Date Issued: November 3, 2003

Issued by: 

D. Robert Lohn
Regional Administrator

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1. INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with NOAA's National Marine Fisheries Service (NOAA Fisheries) and U.S. Fish and Wildlife Service (together "Services"), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations 50 CFR 402.

The analysis also fulfills the Essential Fish Habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2)).

The Cottonwood Resource Area of the Bureau of Land Management (BLM) proposes to carry out the following actions: (1) Replace a culvert that impedes upstream fish passage; (2) remove a culvert that drains a spring; (3) stabilize a washed-out road segment; and (4) construct 10 instream fish habitat improvement structures. The purpose of the East Fork John Day Creek Culvert Replacement and Stream Restoration Project (East Fork Project) is to provide adequate fish passage to an additional 1 mile of stream habitat, improve streambank stability, and reestablish pools and cover that were lost when the stream was scoured by a 1995 debris torrent. The BLM is proposing the actions according to its authority under the Federal Land Policy and Management Act. The administrative record for this consultation is on file at the Idaho Habitat Branch office.

1.1 Background and Consultation History

The BLM presented a summary of the East Fork Project to NOAA Fisheries at the North-Central Idaho Level 1 Team meeting on May 15, 2003. A draft biological assessment (BA) was received by NOAA Fisheries on May 28, 2003. The BA included preliminary determinations that the proposed actions were "likely to adversely affect" Snake River steelhead and "not likely to adversely affect" Snake River spring/summer chinook salmon or their designated critical habitat. The rationale for the "not likely to adversely affect" determination for Snake River spring/summer chinook salmon is based on the fact that chinook salmon are not present in the action area. A steep cascade/falls 2.3 miles upstream from the mouth of John Day Creek blocks chinook salmon passage. Chinook salmon have been observed below the barrier, but have not

been observed above it. NOAA Fisheries discussed the draft BA in a conference call with the BLM on May 29, 2003, and the Level 1 Team agreed with the BLM's preliminary effects determinations. NOAA Fisheries received a complete BA and EFH assessment on the East Fork Project on June 23, 2003, and consultation was initiated at that time.

The East Fork Project would likely benefit steelhead, which are a tribal trust resource. Because the East Fork Project is likely to affect tribal resources, NOAA Fisheries contacted the Nez Perce Tribe (NPT) pursuant to the Secretarial Order (June 5, 1997). A copy of the draft Opinion was electronically mailed to the NPT for review and comments on August 6, 2003. The NPT did not send any comments to NOAA Fisheries concerning the East Fork Project.

1.2 Proposed Action

Proposed actions are defined in the Services' consultation regulations (50 CFR 402.02) as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." Additionally, U.S. Code (16 U.S.C. 1855(b)(2)) further defines a Federal action as "any action authorized, funded, or undertaken or proposed to be authorized, funded, or undertaken by a Federal agency." Because the BLM proposes to fund the actions that may affect listed resources, it must consult under ESA section 7(a)(2) and MSA section 305(b)(2).

The proposed East Fork Project would occur during low flow periods, between July 1 and August 15, in the lower mile of the East Fork John Day Creek. The actions could occur in a single season, or be spread out over 5 years. All disturbed areas would be seeded with shrubs, grasses, and/or forbs. Woody debris would be scattered to reduce erosion. There are no interrelated or interdependent activities with other Federal or private actions associated with this project.

The new culvert would eliminate a fish-passage barrier. It would consist of an open-bottom arch culvert placed at the natural stream grade and sized to pass 100-year flood and bankfull flows. During construction, sediment fences and traps would be used to reduce sediment and erosion. The stream would be de-watered using the existing culvert and/or a temporary lined ditch or diversion culvert. Cofferdam wings would be used to funnel water into the culvert inlet and to prevent water from flowing into the work site at the culvert outlet. Water leaks occurring through the cofferdams would be pumped to an off-channel settling basin and filtered through straw bales before flowing back into the stream. While the stream is diverted, the existing culvert would be removed and the site excavated to hold the new culvert. After installation, the contractor will cover the pipe and resurface the road with gravel. Additionally, 30 to 40 feet of the right stream bank immediately upstream of the culvert will be re-contoured to a more moderate slope. The BLM expects the complete project will take 7-15 days to complete. Detailed diagrams and maps of the culvert and culvert location are provided in the BA.

The culvert which drains a spring would be removed with hand tools. An all-terrain vehicle would be used to pull the 18-inch pipe from its existing location to an area accessible by vehicles. The spring source would be de-watered during construction activities. Sediment fences and traps would be used to reduce sediment from reaching live waters. After the culvert is removed, approximately 20 feet of the channel would be re-contoured to near-natural grade and armored with 3-6 inch rock. In addition to the culvert removal, approximately 10-20 feet of a previously washed-out road segment that parallels East Fork John Day Creek adjacent to the culvert would be re-contoured to a more stable slope.

The instream improvement structures would consist of constructing upstream rock “v” check dams and selectively placing large woody debris (LWD) at approximately 10 sites along the lower 1 mile of East Fork John Day Creek. The dams would be constructed using boulders up to 1.5 feet in diameter. The LWD would be placed in the stream channel at specific locations and secured in place by embedding into the streambank and/or anchoring in place using large boulders. All construction activities and LWD placement would be done using an excavator operating from the streambank. Detailed diagrams and maps of the improvement structures are provided in the BA.

If juvenile steelhead are found in the immediate work area during culvert replacement activities, the BLM would construct temporary block nets above and below the culvert to prevent steelhead from moving into the site during construction activities. Juvenile steelhead trapped between the nets would be captured by an electroshocker and relocated upstream where they would not likely be disturbed by instream work.

1.3 Description of the Action Area

An action area is defined by the Services’ regulations (50 CFR Part 402) as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” The action area, affected by the proposed actions, starts at the project location on the East Fork John Day Creek and extends 1 mile downstream to the confluence with John Day Creek, and from the project site upstream to the headwaters. The action area upstream from the East Fork Project would be affected by restoration of fish passage and the action area downstream would be affected by turbidity and sediment deposition. Downstream effects are unlikely to extend beyond the confluence of the East Fork and mainstem of John Day Creek, since any suspended sediment at that point would be substantially diluted by mainstem flows and coarser sediments would deposit or settle within a short distance below the activity sites. The fifth field hydrologic unit code encompassing the action area is 170602090301. The legal description for the action area is T26N, R2E. The action area serves as spawning and rearing habitat for the Snake River steelhead Evolutionarily Significant Unit (ESU) (Table 1). Since the action area is upstream from a natural, impassable barrier to chinook salmon, it is not designated critical habitat or EFH for chinook salmon.

2. ENDANGERED SPECIES ACT - BIOLOGICAL OPINION

The objective of this Opinion is to determine if the East Fork Project is likely to jeopardize the continued existence of the Snake River steelhead.

2.1 Evaluating the Effects of the Proposed Action

The standards for determining jeopardy and destruction or adverse modification of critical habitat are set forth in section 7(a)(2) of the ESA. In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations and when appropriate¹ combines them with The Habitat Approach (NMFS 1999): (1) Consider the biological requirements and status of the listed species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species, and whether the action is consistent with any available recovery strategy; and (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species or result in the destruction or adverse modification of critical habitat. If jeopardy or adverse modification are found, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy and/or destruction or adverse modification of critical habitat.

The fourth step above (jeopardy/adverse modification analysis) requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (i.e., effects on essential features). The second part focuses on the species itself. It describes the action's effects on individual fish, populations, or both, and places that impact in the context of the ESU as a whole. Ultimately, the analysis seeks to determine whether the proposed action is likely to jeopardize a listed species' continued existence or destroy or adversely modify its critical habitat.

¹The Habitat Approach is intended to provide guidance to NOAA Fisheries staff for conducting analyses, and to explain the analytical process to interested readers. As appropriate, The Habitat Approach may be integrated into the body of Opinions. NOAA staff are encouraged to share The Habitat Approach document with colleagues from other agencies and private entities who are interested in the premises and analysis methods.

2.1.1 Biological Requirements

The first step NOAA Fisheries uses when applying ESA section 7(a)(2) to the listed ESUs considered in this Opinion includes defining the species' biological requirements within the action area. Biological requirements are population characteristics necessary for the listed ESUs to survive and recover to naturally reproducing population sizes at which protection under the ESA would become unnecessary. The listed species' biological requirements may be described as characteristics of the habitat, population or both (McElhany et al. 2000). Interim recovery numbers for Snake River steelhead and spring/summer chinook salmon are 53,700 and 41,900, respectively (NMFS 2002a).

For actions that affect freshwater habitat, NOAA Fisheries may describe the habitat portion of a species' biological requirements in terms of a concept called properly functioning condition (PFC). The PFC is defined as the sustained presence of natural² habitat-forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation (NMFS 1999). The PFC, then, constitutes the habitat component of a species' biological requirements. Although NOAA Fisheries is not required to use a particular procedure to describe biological requirements, it typically considers the status of habitat variables in a matrix of pathways and indicators (MPI) (NMFS 1996, Table 1) that were developed to describe PFC in forested montane watersheds. In the PFC framework, baseline environmental conditions are described as "properly functioning," "at risk," or "not properly functioning."

The East Fork Project would not occur within designated critical habitat. Freshwater critical habitat can include all waterways, substrates, and adjacent riparian areas³ below longstanding, natural impassable barriers (i.e., natural waterfalls in existence for at least several hundred years) and dams that block access to former habitat. Essential features of critical habitat for listed species are: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) safe passage conditions. A steep cascade/falls, 2.3 miles from the mouth of John Day Creek, blocks Snake River spring/summer chinook salmon passage to the activity sites.

2.1.2 Status and Generalized Life History of Listed Species

In this step, NOAA Fisheries considers the current status of the listed species within the action area, taking into account population size, trends, distribution, and genetic diversity. To assess the

²The word "natural" in this definition is not intended to imply "pristine," nor does the best available science lead us to believe that only pristine wilderness will support salmon.

³Riparian areas adjacent to a stream provide the following functions: shade, sediment delivery/filtering, nutrient or chemical regulation, streambank stability, and input of large woody debris and fine organic matter.

current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species and also considers any new data that is relevant to the species' status. A discussion of the general life history of Snake River steelhead is found in Appendix A.

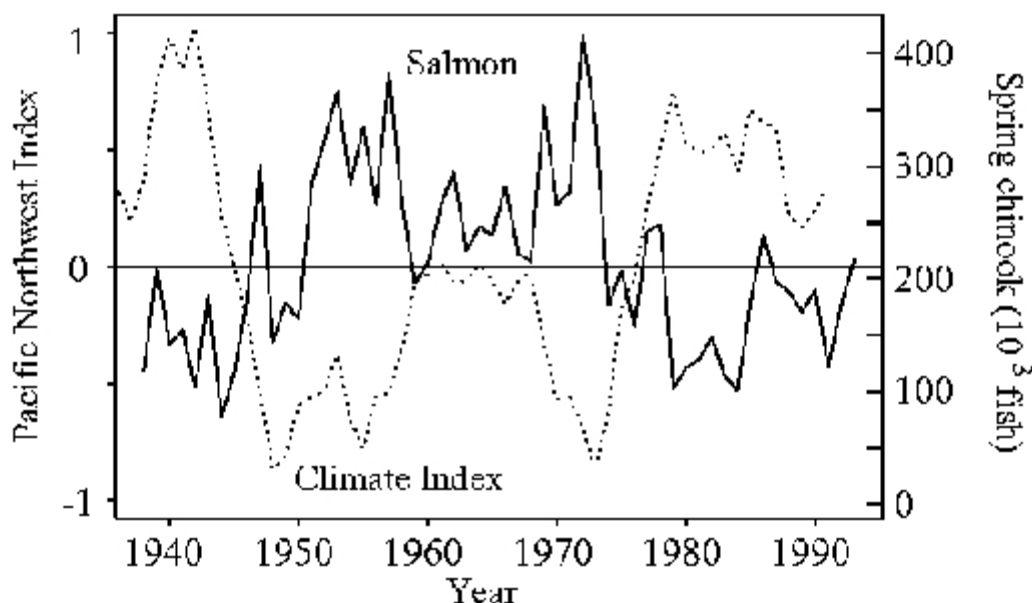
The BLM found that the East Fork Project is likely to adversely affect Snake River steelhead identified in Table 1. Based on the life history of this ESU, the BLM determined that it is likely that adult spawning, incubation, and juvenile rearing (fry to smolt stages) would be adversely affected by the East Fork Project.

Table 1. References for additional background on listing status, critical habitat designation, protective regulations, and life history for the ESA-listed species considered in this consultation.

Species ESU	Status	Critical Habitat Designation	Protective Regulations	Life History
Snake River steelhead (<i>Oncorhynchus mykiss</i>)	Threatened; August 18, 1997; 62 FR 43937	under review	July 10, 2000; 65 FR 42422	Busby, <i>et al.</i> 1996; Nichelson, <i>et al.</i> 1992

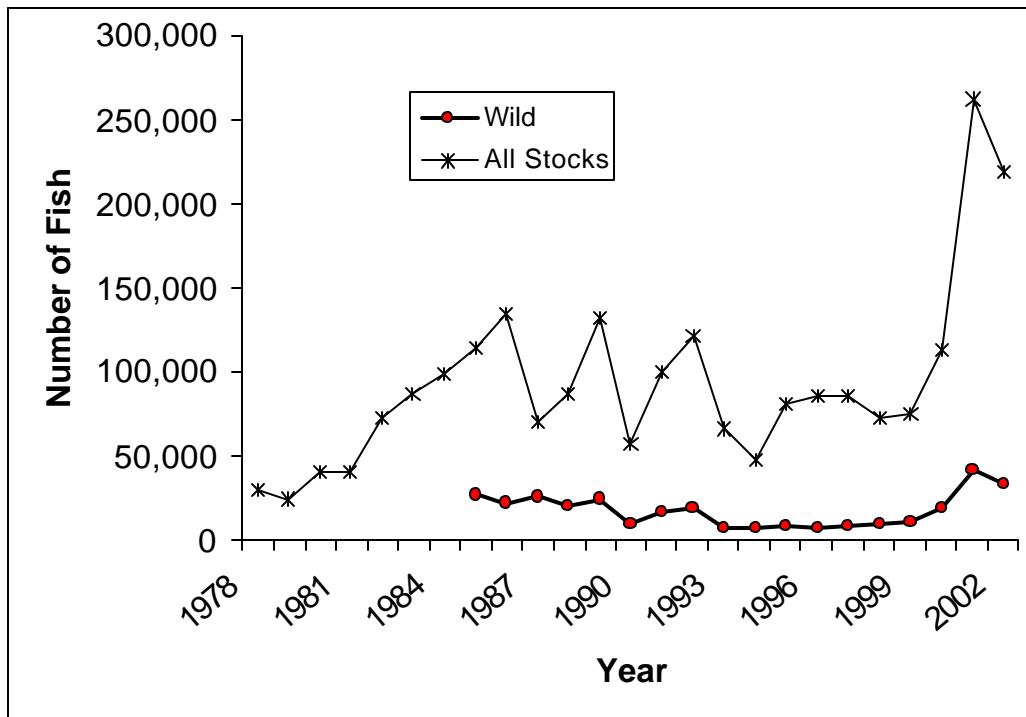
Pacific salmon and steelhead in the Pacific Northwest exhibit cyclic variation in population size that closely corresponds to oscillations in climatic conditions affecting marine temperatures and circulations and freshwater temperatures and precipitation patterns (Anderson 1996, Finney *et al.* 2002, Hare and Francis 1994; Mantua *et al.* 1997). The Pacific Northwest Index (PNI) developed by Ebbesmeyer and Strickland (1995) is a composite index that characterizes Pacific Northwest climate patterns in both coastal waters and freshwater habitats. The PNI uses air temperatures in the San Juan Islands, precipitation in the Cascade Mountains, and snow pack depth on Mount Rainier to calculate the index. The PNI is correlated with variations in the Columbia River spring chinook salmon catch. The cool wet climate pattern, which is characterized by negative PNI values, corresponds with above average Columbia River spring chinook catch and periods of warm dry weather corresponds with lower than average catch (Figure 1).

Figure 1. Relationship of the Pacific Northwest index and catch of Columbia River chinook salmon, from Anderson (1996).



The 5-year running average PNI indicates a shift to a warm/dry period beginning in 1977, and continuing today. Moderately warm/dry conditions were observed in 1996 and 2000, and wet/cold conditions were observed in 1997 and 1999, which are likely related to exceptionally large adult anadromous fish returns observed in 2000-2002. Since climatic and ocean conditions vary from year-to-year, the recent increases in anadromous fish populations are likely to be short-lived. The recent trends for wild Snake River steelhead and spring/summer chinook salmon population size is indeterminate (Figure 2), with gradual declines observed since the late 1970s, and a recent spike in population size. Whether the recent population increase represents an increasing population trend (inflection point), or an oscillation in the declining trend, cannot be determined before several years have passed beyond the point of inflection. In light of the effects of climatic variation, the survival and recovery of Pacific salmon and steelhead depends on their ability to persist through episodic periods of warm/dry conditions where there is naturally low survival. To avoid extinction, it is necessary to maintain or restore essential habitat features that sustain anadromous fish through periods of unfavorable climatic conditions.

Figure 2. Counts of wild and aggregate (wild and hatchery-origin) Snake River steelhead passing over Lower Granite Dam, 1978 -2002 (from NPPC 2003).



2.1.2.1 Snake River Steelhead

The Snake River steelhead ESU, listed as threatened on August 18, 1997, (62 FR 43937), includes all natural-origin populations of steelhead in the Snake River basin of southeast Washington, northeast Oregon, and Idaho. None of the hatchery stocks in the Snake River basin are listed, but several are included in the ESU.

Natural runs of Snake River steelhead have been generally declining in abundance over the past decades. For the Snake River steelhead ESU as a whole, the median population growth rate (λ) for years 1980-1994 (most recent analysis available), ranges from 0.978 to 0.699, depending on the assumed number of hatchery fish reproducing in the river (Table 2).

In recent years with large adult returns, the increase in hatchery fish compared to wild fish has been substantially greater; consequently, even though the number of recruits per spawner has appeared to increase for natural fish since λ was calculated, the estimate of λ for natural fish may actually decline from the values in Table 2, due to the disproportionate increase in hatchery fish. No estimates of historical (pre-1960s) Snake River steelhead abundance are

available. In general, aggregate (combined counts of wild and hatchery-origin fish) steelhead abundance declined sharply in the early 1970s, rebuilt modestly from the mid-1970s through the 1980s, and declined again during the 1990s (NPPC 2003). Adult returns at Lower Granite Dam dramatically increased since 2000; however, the recent increase is due primarily to hatchery returns, with wild fish comprising only 15-18% of the adult returns since 2000 (Figure 2). The large returns in recent years are thought to be a result of cyclic oceanic and climatic conditions favorable to anadromous fish (Marmorek and Peters 1998). The longest consistent indicator of steelhead abundance in the Snake River basin is derived from counts of natural-origin steelhead at the uppermost dam on the lower Snake River. According to these estimates, the abundance of natural-origin summer steelhead at the uppermost dam on the Snake River declined from a 4-year average of 58,300 in 1964 to a 4-year average of 8,300 ending in 1998. The most recent 4-year average of wild fish (1998-2002) is 26,358 adults. Parr densities in natural production areas have been substantially below estimated capacity (Hall-Griswold and Petrosky 1996). Downward trends of wild steelhead in the 1990s, increased numbers of hatchery fish since 2000, and low parr densities indicate a particularly severe problem for B-run steelhead (See Appendix A for further explanation), whose loss would substantially reduce life history diversity of Snake River Basin steelhead.

Table 2. Annual rate of population change (λ) in Snake River steelhead, absolute risk of extinction (1 fish/generation), and risk of 90% decline in 24 and 100 years for the period 1980-1994[†]. The range of reported values assumes that hatchery-origin fish either do not contribute to natural production or are as productive as natural-origin spawners.

Model Assumptions	λ	Risk of Extinction		Probability of 90% Decrease in Stock Abundance	
		24 years	100 years	24 years	100 years
No Correction for Hatchery Fish	0.978	A-Run 0.000 B-Run 0.000	A-Run 0.000 B-Run 0.000	A-Run 0.000 B-Run 0.060 Aggregate 0.000	A-Run 0.000 B-Run 0.520 Aggregate 0.434
No Instream Hatchery Reproduction	0.910	A-Run 0.000 B-Run 0.000	A-Run 0.010 B-Run 0.093	A-Run 0.200 B-Run 0.730 Aggregate 0.476	A-Run 1.000 B-Run 1.000 Aggregate 1.000
Instream Hatchery Reproduction = Natural Reproduction	0.699	A-Run 0.000 B-Run 0.000	A-Run 1.000 B-Run 1.000	A-Run 1.000 B-Run 1.000 Aggregate 1.000	A-Run 1.000 B-Run 1.000 Aggregate 1.000
[†] From Table B-2a and B-2b. Cumulative Risk Initiative. September 5, 2000, revised appendix B (McClure et al. 2000)					

Some of the significant factors in the declining populations are mortality associated with the many dams along the Columbia and Snake Rivers, losses from harvest, loss of access to more than 50% of their historic range, and degradation of habitat used for spawning and rearing. The Harpster Dam blocked steelhead passage from 1910 - 1935, while the Lewiston Dam limited

steelhead passage, but was not a complete barrier (Cramer *et al.* 1998). Possible genetic introgression from hatchery stocks is another threat to Snake River steelhead since wild fish comprise such a small proportion of the population (Busby *et al.* 1996).

Additional information on the biology and habitat elements of Snake River steelhead are described in Busby *et al.* (1996) and detailed information on the current range-wide status of Snake River steelhead, under the environmental baseline, is described in Appendix A, attached.

2.1.3 Environmental Baseline in the Action Area

The environmental baseline is defined as: "the past and present impacts of all Federal, state, or private actions and other human activities in the action area, including the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of state and private actions that are contemporaneous with the consultation in progress" (50 CFR 402.02). In step 2, NOAA Fisheries' evaluates the relevance of the environmental baseline in the action area to the species' current status. In describing the environmental baseline, NOAA Fisheries evaluates essential features of designated critical habitat and the listed Pacific salmon ESUs affected by the proposed action.

In general, the environment for listed species in the Columbia River Basin (CRB), including those that migrate past or spawn upstream from the action area, has been dramatically affected by the development and operation of the Federal Columbia River Power System (FCRPS). Storage dams have eliminated mainstem spawning and rearing habitat, and have altered the natural flow regime of the Snake and Columbia Rivers, decreasing spring and summer flows, increasing fall and winter flow, and altering natural thermal patterns. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs, disturbing riparian areas and possibly stranding fish in shallow areas as flows recede. The eight dams in the migration corridor of the Snake and Columbia Rivers kill or injure a portion of the smolts passing through the area. The low velocity movement of water through the reservoirs behind the dams slows the smolts' journey to the ocean and enhances the survival of predatory fish (Independent Scientific Group 1996, National Research Council 1996). Formerly complex mainstem habitats in the Columbia, Snake, and Willamette Rivers have been reduced, for the most part, to single channels, with floodplains reduced in size, and off-channel habitats eliminated or disconnected from the main channel (Sedell and Froggatt 1984; Independent Scientific Group 1996; and Coutant 1999). The amount of large woody debris in these rivers has declined, reducing habitat complexity and altering the rivers' food webs (Maser and Sedell 1994).

Other human activities that have degraded aquatic habitats or affected native fish populations in the CRB include stream channelization, elimination of wetlands, construction of flood control dams and levees, construction of roads (many with impassable culverts), timber harvest, splash dams, mining, water withdrawals, unscreened water diversions, agriculture, livestock grazing,

urbanization, outdoor recreation, fire exclusion/suppression, artificial fish propagation, fish harvest, and introduction of non-native species (Henjum *et al.* 1994; Rhodes *et al.* 1994; National Research Council 1996; Spence *et al.* 1996; and Lee *et al.* 1997). In many watersheds, land management and development activities have: (1) reduced connectivity (i.e., the flow of energy, organisms, and materials) between streams, riparian areas, floodplains, and uplands; (2) elevated fine sediment yields, degrading spawning and rearing habitat; (3) reduced large woody material that traps sediment, stabilizes streambanks, and helps form pools; (4) reduced vegetative canopy that minimizes solar heating of streams; (5) caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations; (6) altered peak flow volume and timing, leading to channel changes and potentially altering fish migration behavior; and (7) altered floodplain function, water tables and base flows (Henjum *et al.* 1994; McIntosh *et al.* 1994; Rhodes *et al.* 1994; Wissmar *et al.* 1994; National Research Council 1996; Spence *et al.* 1996; and Lee *et al.* 1997).

To address problems inhibiting salmonid recovery in CRB tributaries, the Federal resource and land management agencies developed the *All H Strategy* (Federal Caucus 2000). Components of the *All H Strategy* commit these agencies to increased coordination and a fast start on protecting and restoring.

John Day Creek is a tributary to the lower Salmon River and extends approximately 8 miles from the mouth at the Salmon River to its headwaters. Much of the mainstem of John Day Creek and its tributaries consist of steep channels flowing in confined valleys. Elevation of the watershed ranges from 1,800 to 7,300, feet with an average watershed slope of 13%. The lower portion of John Day Creek provides spawning and rearing habitat for Snake River steelhead and spring/summer chinook salmon. A steep cascade/falls at river mile 2.3 blocks spring/summer chinook salmon passage. The cascade lacks pools needed by chinook salmon to pass the cascade during summer; however, steelhead can pass the barrier during certain flows. Above the cascade, fish monitoring conducted from 1996 through 2001 documented low numbers of steelhead, but chinook salmon were not observed (BLM 2003).

Habitat and stream conditions in the mainstem John Day and East Fork John Day Creeks have been altered by roads, timber harvest, hydroelectric development, grazing, feedlots, private residences and mining. There are currently about 56.5 miles (2.6 mi/mi²) of roads in the John Day watershed. Road density in the lower mainstem John Day is approximately 3.6 mi/mi² and in the East Fork John Day, about 3.4 mi/mi². Several mass failures have been attributed to Forest Service roads in the East Fork. In May 1995, a debris flow originating from a plugged culvert in the East Fork washed out road fills, scoured the stream channel, and eliminated pools and most instream structure in the lower East Fork. Approximately 612 acres (15%) of timber have been harvested in the lower John Day watershed and 255 acres (7%) in the East Fork. A hydroelectric project was constructed in 1988 in the mainstem John Day, using diverted water from the creek to a powerhouse where it is discharged back into the stream channel. The hydropower diversion is at least a partial barrier, depending on the species or time of year. Cattle grazing occurs in the lower elevations of the watershed during the spring and fall, and upper elevations during summer.

and fall. Winter cattle feeding occurs along the lower mainstem in feedlots fenced off from the creek. Riparian areas in the lower 2 miles of John Day Creek and lower 0.5 miles of the East Fork John Day are damaged from cattle grazing. Several private residences are located along the lower 3 miles of John Day Creek and are accessed by a county road.

In the East Fork John Day Creek, matrix indicators for fish passage (juvenile), cobble embeddedness, large woody debris, pool frequency, pool quality, habitat refugia, streambank stability, water yield, and road density are rated as “not properly functioning.” Indicators for streamside road density, landslide-prone road density, riparian vegetation, peak/base flow, sediment yield, floodplain connectivity, suspended sediment, fish passage (adult), percent surface fines, percent fines by depth, and off-channel habitat were rated as “functioning at risk.” Roads, past timber harvest, and the 1995 debris flows in the East Fork were sources of the high levels of sedimentation, loss of LWD, pools, and streambank stability in the lower East Fork drainage. High levels of cobble embeddedness reported by the BLM indicate reduced quality and quantity of summer and winter rearing habitat, and may be a limiting factor to fish production.

The biological requirements of the listed species are not being met under the environmental baseline. Conditions in the action area need to improve, and any further degradation of the baseline, or delay in improvement of these conditions, would probably further decrease the likelihood of survival and recovery of the listed species under the environmental baseline.

Pacific salmon populations also are substantially affected by variation in the freshwater and marine environments. Ocean conditions are a key factor in the productivity of Pacific salmon populations. Stochastic events in freshwater (flooding, drought, snowpack conditions, volcanic eruptions, etc.) can play an important role in a species’ survival and recovery, but those effects tend to be localized compared to the effects associated with the ocean. The survival and recovery of these species depends on their ability to persist through periods of low natural survival due to ocean conditions, climatic conditions, and other conditions outside the action area. Freshwater survival is particularly important during these periods because enough smolts must be produced so that a sufficient number of adults can survive to complete their oceanic migration, return to spawn, and perpetuate the species. Therefore it is important to maintain or restore PFC in order to sustain the ESU through these periods. Additional details about the importance of freshwater survival to Pacific salmon populations can be found in Federal Caucus (2000), NMFS (2000), and Oregon Progress Board (2000).

2.2 Analysis of Effects

Effects of the action are defined as: “the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline” (50 CFR 402.02). Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing the value of

habitat for meeting the species' biological requirements or impairing the essential features of critical habitat. Indirect effects are defined in 50 CFR 402.02 as "those that are caused by the proposed action and are later in time, but still are reasonably certain to occur." They include the effects on listed species or critical habitat of future activities that are induced by the proposed action and that occur after the action is completed. "Interrelated actions are those that are part of a larger action and depend on the larger action for their justification" (50 CFR 403.02). "Interdependent actions are those that have no independent utility apart from the action under consideration" (50 CFR 402.02).

In step 3 of the jeopardy and adverse modification analysis, NOAA Fisheries evaluates the effects of proposed actions on listed species and seeks to answer the question of whether the species can be expected to survive with an adequate potential for recovery. In watersheds where critical habitat has been designated, NOAA Fisheries must make a separate determination of whether the action will result in the destruction or adverse modification of critical habitat (ESA, section 3, (3) and section 3(5A)).

2.2.1 Habitat Effects

NOAA Fisheries will consider any scientifically credible analytical framework for determining an activity's effect. In order to streamline the consultation process and to lead to more consistent effects determinations across agencies, NOAA Fisheries where appropriate recommends that action agencies use the MPI and procedures in NMFS (1996), particularly when their proposed action would take place in forested montane environments. Regardless of the analytical method used, if a proposed action is likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward PFC, it cannot be found consistent with conserving the species.

For the streams typically considered in salmon habitat-related consultations, a watershed is a logical unit for analysis of potential effects of an action (particularly for actions that are large in scope or scale). Healthy salmonid populations use habitats throughout watersheds (Naiman *et al.* 1992), and riverine conditions reflect biological, geological and hydrological processes operating at the watershed level (Nehlsen *et al.* 1997; Bisson *et al.* 1997; and NMFS 1999).

Although NOAA Fisheries prefers watershed-scale consultations due to greater efficiency in reviewing multiple actions, increased analytic ability, and the potential for more flexibility in management practices, often it must analyze effects at geographic areas smaller than a watershed or basin due to a proposed action's scope or geographic scale. Analyses that are focused at the scale of the site or stream reach may not be able to discern whether the effects of the proposed action will contribute to or be compounded by the aggregate of watershed impacts. This loss of analytic ability typically should be offset by more risk averse proposed actions and ESA analysis in order to achieve parity of risk with the watershed approach (NMFS 1999).

The East Fork Project BA provides an analysis of the effects of the proposed actions on Snake River steelhead and essential features of their habitat. The analysis in this Opinion uses the MPI and procedures in NMFS (1996), the information in the BA, and the best scientific and commercial data available.

Culvert replacements require a sequence of instream work that involves constructing a temporary barrier to exclude fish from the work area (when steelhead are present); temporary diversion of water; removal of existing culverts; installation of new culverts; removal of the temporary diversions; reshaping the fill; and planting bare soils. Juvenile steelhead may be harmed or killed by the proposed actions through efforts to relocate the fish, stranding fish in dewatered channels, crushing fish with construction equipment, or through deposition of sediment in redds prior to emergence of fry. Harm or mortality is most likely to occur, in limited circumstances, where juvenile steelhead and/or salmon occupy the culvert, the inlet or outlets of the culvert, or where the culvert is immediately upstream from redds where the fry have not yet emerged. Otherwise, steelhead and salmon are expected to either avoid the work area, or be too far away to be harmed or killed by instream activities or sediment. Based on the location of potential spawning areas and observed distribution of fish, juvenile steelhead are not expected to be harmed or killed by the proposed actions in the East Fork John Day watershed.

Excavation and replacement of road fills and stream channel materials are likely to temporarily increase stream turbidity, sedimentation, and rearrange substrate materials. Based on similar culvert replacement projects on the Bitterroot, Flathead, and Lolo National Forests, each culvert replacement will produce a total of 1.5 to 2 tons of sediment, nearly all of which is expected to be redeposited within 150 feet of the culverts (USFS 2002). Turbidity created from the culvert replacement, culvert removal/road restoration, and instream fish habitat improvement projects could temporarily diminish feeding downstream. Increased turbidity and sediment levels are likely to exceed the natural background levels during construction in the stream throughout the period of construction. The primary effect of increased turbidity on salmonids is diminished feeding efficiency. Fish affected by turbidity may temporarily or permanently leave the area to avoid its effects. Mortality or harm from turbidity is not expected to occur because juvenile fish will likely avoid the turbidity by moving out of the sediment plume. The extent of turbid flows is also likely to be short-lived (several hours or less) and localized (USFS 2002).

Deposition of sediment in spawning habitat could potentially trap steelhead fry that have not emerged from the gravels, or smother eggs. However, these effects are unlikely because most, if not all, steelhead fry in the action area typically emerge from the gravels prior to July 1. In addition, little or no spawning habitat is available within several hundred feet downstream of the project sites. Any effects of sediment deposition in spawning gravels from the proposed actions are unlikely to persist beyond the spring runoff, since high flows would typically redistribute the sediment created by construction activities over a wide area or transport the sediment downstream. Sedimentation could reduce interstitial space and overwintering habitat, but the volume of sediment produced and the area affected by sediment deposition is expected to be small.

Use of heavy equipment during construction creates the possibility of accidental spills of fuel, lubricants, hydraulic fluid and similar contaminants into the riparian zone or water where they could injure or kill aquatic organisms. Discharge of construction water used for vehicle washing, concrete washout, pumping for work area isolation, and other purposes can carry sediments and a variety of contaminants to the riparian area and stream. Heavy equipment can cause soil compaction, thus reducing soil permeability and infiltration (NMFS 2002b). However, heavy equipment impacts to riparian areas and streams are expected to be minimized because refueling and cleaning of equipment will be at least 100 feet away from a waterway.

Several long-term beneficial effects are expected from these actions. Hydrologic function will be improved by reducing the probability of culvert failures and by re-establishing more natural patterns of bedload and woody debris movement. The new culvert will be sized to pass 100-year flood events and would allow normal bedload movement. The physical changes will remove or reduce migration impediments to steelhead and other aquatic organisms. The length of accessible steelhead habitat restored by the culvert replacement will increase by nearly 1 mile. The culvert removal will create sediment during the process of removing the culvert and eliminate erosion from the culvert outlet thereafter. Fish habitat improvement structures and placement of boulders and large woody debris will increase pool habitat and partially restore instream cover lost from the debris flow. The proposed projects are expected to improve in-stream habitat and passage for aquatic species, improve bank stability, recover channel complexity, and restore native riparian vegetation.

2.2.2 Species Effects

The diversion of East Fork John Day Creek during the culvert replacement project may strand juvenile salmonids in the dewatered channel and temporarily impede movements of salmonids through the work site. The impacts associated with dewatering are expected to be reduced through the use of sequential dewatering that will enable fish to move with the receding water.

Diverting water will also cause the temporary loss (burial, dessication, and displacement) of macroinvertebrate habitat. Aquatic invertebrates serve as an important source of prey for salmonids and the loss of their habitat may reduce foraging opportunities for listed salmonids. Effects associated with the disruption of the streambed likely would be short lived as new invertebrates tend to re-colonize disturbed areas (Allan 1995). In the action area, re-colonization rates are expected to be rapid due to the small area of disturbance and relatively short time period for construction activities.

Electrofishing, if it is used, may result in direct mortality of young-of-the-year and juvenile salmonids. Physical injuries from electrofishing can include internal hemorrhaging, spinal misalignment, or fracture of vertebrae. The likelihood of injury or mortality will be reduced by using qualified BLM biologists to ensure safe capture, handling and release of fish.

The effect that a proposed action has on particular essential features or MPI pathways can be translated into a likely effect on population growth rate. In the case of this consultation, it is not possible to quantify an incremental change in survival for Snake River steelhead.

Based on the effects described above, the proposed actions will have a positive effect on the survival and recovery of Snake River steelhead. The production capacity of steelhead is expected to increase in the action area as a result of the proposed actions. However, changes in λ , as a result of restored fish passage and habitat, cannot be quantified, since the expected incremental change in egg-to-smolt survival in the action area is unknown.

2.2.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." These activities within the action area also have the potential to adversely affect the listed species and critical habitat. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being reviewed through separate section 7 consultation processes. Federal actions that have already undergone section 7 consultations have been added to the description of the environmental baseline in the action area.

State, tribal, and local government actions will likely be in the form of legislation, administrative rules or policy initiatives. Government and private actions may encompass changes in land and water uses, including ownership and intensity, any of which could adversely affect listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties.

Changes in the economy have occurred in the last 15 years, and are likely to continue, with less large-scale resource extraction, more targeted extraction, and significant growth in other economic sectors. Growth in new businesses, primarily in the technology sector, is creating urbanization pressures and increased demands for buildable land, electricity, water supplies, waste-disposal sites, and other infrastructure.

Economic diversification has contributed to population growth and movement, and this trend is likely to continue. Such population trends will result in greater overall and localized demands for electricity, water, and buildable land in the action area; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure. The impacts associated with these economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will likely be negative, unless carefully planned for and mitigated.

The John Day watershed consists mostly of Federal lands managed by the Nez Perce National Forest and BLM. Privately owned lands occur in the lower portions of John Day Creek and the East Fork John Day Creek. The effects of past activities in the John Day watershed have been incorporated into the environmental baseline of this Opinion. Extensive cattle grazing has occurred most years on private and state lands in the watershed, and is expected to continue. Primary grazing impacts are associated with the lower 2 miles of John Day Creek and the lower 0.5 miles of East Fork John Day Creek. Cattle grazing has deleterious effects on riparian vegetation and stream bank stability, and may contribute to sediment produced by the East Fork Project. Other than cattle grazing, there are no known future non-Federal activities anticipated in the action area that are not already part of the environmental baseline.

The Idaho Department of Environmental Quality will establish TMDLs in the Snake River basin, a program regarded as having positive water quality effects. The TMDLs are required by court order, so it is reasonably certain they will be set. The State of Idaho has created an Office of Species Conservation to work on subbasin planning and to coordinate the efforts of all state offices addressing natural resource issues. Demands for Idaho's groundwater resources have caused groundwater levels to drop and reduced flow in springs for which there are senior water rights. The Idaho Department of Water Resources has begun studies and promulgated rules that address water right conflicts and demands on a limited resource. The studies have identified aquifer recharge as a mitigation measure with the potential to affect the quantity of water in certain streams, particularly those essential to listed species.

2.2.4 Consistency with Listed Species ESA Recovery Strategies

Recovery is defined by NOAA Fisheries regulations (50 CFR 402) as an "improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4 (a)(1) of the Act." Recovery planning is underway for listed Pacific salmon in the Northwest with technical recovery teams identified for each domain. Recovery planning will help identify measures to conserve listed species and increase the survival of each life stage. NOAA Fisheries also intends that recovery planning identify the areas/stocks most critical to species conservation and recovery and thereby evaluate proposed actions on the basis of their effects on those areas/stocks.

Until the species-specific recovery plans are developed, the FCRPS Opinion and the related December 2000 *Memorandum of Understanding Among Federal Agencies Concerning the Conservation of Threatened and Endangered Fish Species in the Columbia River Basin* (together these are referred to as the Basinwide Salmon Recovery Strategy) provides the best guidance for judging the significance of an individual action relative to the species-level biological requirements. In the absence of completed recovery plans, NOAA Fisheries strives to ascribe the appropriate significance to actions to the extent available information allows. Where information is not available on the recovery needs of the species, either through recovery planning or otherwise, NOAA Fisheries applies a conservative substitute.

The BLM has specific commitments to uphold under the Basinwide Salmon Recovery Strategy. For Federal lands, PACFISH, the Northwest Forest Plan, and land management plans define these commitments. The proposed actions are consistent with these commitments by keeping short-term sediment production to a minimum and by reducing long-term sediment production, adding increased aquatic habitat structure and complexity, and by increasing fish passage to upstream spawning and rearing areas.

2.3 Conclusions

This conclusion is based on the following considerations: (1) The proposed actions would restore steelhead access to approximately 1 mile of stream in the East Fork John Day Creek; (2) any harm or mortality resulting from the proposed actions are expected to occur in rare circumstances since juvenile steelhead are not expected to be present in large numbers at the work sites; (3) any harm or mortality is expected to be limited in extent to the immediate area at the culvert replacement, culvert removal, and instream fish habitat improvement sites; (4) any harm or mortality is expected to be limited in duration to no more than 2 weeks at a given site; and (5) sediment or turbidity from the projects would not affect the vast majority of steelhead and salmon spawning areas in the John Day Creek watershed, as primary spawning and rearing areas for steelhead and salmon occur downstream from the barrier at stream mile 2.3 in the mainstem John Day Creek. In reaching these determinations, NOAA fisheries used the best scientific and commercial data available.

2.3.1 Critical Habitat Conclusion

After reviewing the current condition of the critical habitat, the environmental baseline for the action area, the effects of the proposed actions, and cumulative effects in the action area, it is NOAA Fisheries' opinion that the East Fork Project is not likely to destroy or adversely modify their critical habitat. Critical habitat is not designated in the action area.

2.3.2 Species Conclusion

After reviewing the current status of Snake River steelhead, the environmental baseline for the action area, the effects of the proposed actions, and cumulative effects in the action area, it is NOAA Fisheries' opinion that the East Fork Project is not likely to jeopardize the continued existence of Snake River steelhead.

2.4 Conservation Recommendations

Conservation recommendations are defined as “discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information” (50 CFR 402.02). Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. NOAA Fisheries has no conservation recommendations to make for the East Fork Project.

2.5 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required if: (1) The amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending conclusion of the reinitiated consultation.

2.6 Incidental Take Statement

The ESA at Section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” [16 USC 1532(19)]. Harm is defined by regulation as “an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering” [50 CFR 222.102]. Harass is defined as “an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering” [50 CFR 17.3].

Incidental take is defined as “any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity” [50 CFR 17.3]. The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures (RPMs) that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the RPMs.

2.6.1 Amount or Extent of Take

The proposed actions are reasonably certain to result in incidental take of the listed species. NOAA Fisheries is reasonably certain the incidental take described here will occur because: (1) The listed species are known to occur in the action area; and (2) the proposed actions are likely to cause impacts to critical habitat significant enough to impair feeding, breeding, migrating, or sheltering for the listed species. Despite the use of best scientific and commercial data available, NOAA Fisheries cannot quantify a specific amount of incidental take of individual fish or incubating eggs for these actions. Instead, the extent of take is anticipated to be limited to the length of stream occupied by the culvert in the culvert replacement project, the length of streambank affected in the culvert removal project, the length of stream channel affected in the fish habitat improvement project, and extending 50 feet upstream and 150 feet downstream of each project site. The number of juvenile fish killed or injured during instream work is expected to be low because healthy fish typically flee from people and equipment, and few, if any, redds are likely to occur within a distance where sedimentation might be heavy enough to prevent eggs from maturing or fry from emerging from the gravels. If the proposed actions result in areas of disturbance exceeding the extent of take outlined above, the BLM would need to reinitiate consultation. The authorized take includes only take caused by the proposed actions within the action area as defined in this Opinion.

2.6.2 Reasonable and Prudent Measures

Reasonable and Prudent Measures (RPMs) are non-discretionary measures to minimize take, that may or may not already be part of the description of the proposed action. They must be implemented as binding conditions for the exemption in section 7(o)(2) to apply. The BLM has the continuing duty to regulate the activities covered in this incidental take statement. If the BLM fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. NOAA Fisheries believes that activities carried out in a manner consistent with these RPMs, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant RPMs will require further consultation.

NOAA Fisheries believes that the following RPMs are necessary and appropriate to minimize take of listed fish resulting from implementation of these actions. These RPMs would also minimize adverse effects on designated critical habitat.

The BLM shall:

1. Monitor the effects of the proposed actions to determine the actual project effects on listed fish and report to NOAA Fisheries (50 CFR 402.14 (i)(3)). Monitoring should detect adverse effects of the proposed actions, assess the actual levels of incidental take in comparison with anticipated incidental take documented in the Opinion, and detect circumstances where the level of incidental take is exceeded.
2. Minimize the impact of incidental take resulting from instream work activities.
3. Minimize the impact of incidental take resulting from fuels and/or toxic chemicals.
4. Minimize the impact of incidental take resulting from streambank disturbance.

2.6.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the actions must be implemented in compliance with the following terms and conditions, which implement the RPMs described above for each category of activity. These terms and conditions are non-discretionary.

1. To implement RPM # 1 (monitor the impact of incidental take), above, the BLM shall:
 - a. Monitor the effectiveness of erosion control measures at the culvert replacement, culvert removal, and instream fish habitat improvement sites daily during implementation of the projects and on at least two occasions (e.g. one month and nine months) after completion of the projects.
 - b. Monitor the success of plantings at the culvert replacement, culvert removal, and instream fish habitat improvement sites after one growing season and replant any dead or dying plants, as necessary.
 - c. Maintain records of all listed fish removed from the work site. Records shall identify the location, date, species, number of individuals, condition of fish upon release, and also identify any steelhead that are injured or killed.
 - d. Submit by March 15 of each year, the above information in an annual monitoring report, to: NOAA Fisheries, Grangeville Field Office, 102 N. College, Grangeville, Idaho 83530.

2. To implement RPM # 2 (minimize the impact of incidental take resulting from instream work activities), above, the BLM shall:
 - a. Conduct all instream culvert and instream fish habitat improvement activities from July 1 to August 15.
 - b. Operate equipment used for culvert and instream fish habitat improvement activities from existing roads or the streambank (construction equipment will not enter the active stream).
 - c. Require operators of construction equipment and/or construction personnel to immediately cease operation if a sick, injured, or dead specimen of a threatened or endangered species is found. The finder must notify the BLM, which in turn will contact the Vancouver Field Office of NOAA Fisheries Law Enforcement at (360) 418-4246 before resuming activities. The finder must take care in handling sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.
 - d. Survey all project sites, prior to operating equipment, to determine if steelhead are present at the sites. Surveys will be conducted by looking for fish from the stream bank with polarized glasses or by snorkeling. If steelhead are present, BLM personnel shall construct a temporary fish barrier above and below the construction site using a block net or similar arrangement. The net shall be installed to prevent fish from entering the construction area, and the net shall remain in place for the duration of instream work at the project site. Any steelhead present in between the nets shall be captured and moved upstream from the construction area, and released in a suitable pool.
 - e. Divert stream flow around culvert replacement and removal sites through a temporary culvert, or a trench lined with plastic, rocks, or other suitable material that prevent erosion.
 - f. Include terms and conditions in any permit, grant, or contract issued for the implementation of the actions described in this Opinion.
3. To implement RPM # 3 (minimize the impact of incidental take resulting from fuels and toxic chemicals), above, the BLM shall:
 - a. Locate areas for fuel storage, equipment storage, and equipment refueling at least 100 feet away from any water body.

- b. Have available spill containment materials at each project site.
 - c. Inspect and clean all equipment (e.g. excavator and ATV) used for construction prior to arriving at the project.
 - d. Inspect heavy equipment daily to assure there are no hydraulic fluid, fuel, or oil leaks.
4. To implement RPM # 4 (minimize the impact of incidental take resulting from stream bank disturbance), above, the BLM shall:
- a. Use appropriate sediment control measures at culvert replacement and removal sites (e.g. silt fences, straw bales, lined ditches) to minimize sediment transport into the stream channel and downstream from project sites.
 - b. Minimize disturbance of existing vegetation at the culvert replacement, culvert removal, and instream fish habitat improvement sites.
 - c. Reseed and replant all areas disturbed by construction activities with native grasses, shrubs, or trees.

3. MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Statutory Requirements

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan.

Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2)).
- NOAA Fisheries must provide conservation recommendations for any Federal or state action that may adversely affect EFH (section 305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the

impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (section 305(b)(4)(B)).

The EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA section 3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

The EFH consultation with NOAA Fisheries is required for any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed actions may adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects on EFH.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fishery Management Council (PFMC) has designated EFH for three species of Federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed actions and action area are detailed above in Sections 1.2 and 1.3 of this document. The action area does not include habitats that have been designated as EFH for various life-history stages of Snake River chinook salmon. Since the action area is upstream from a natural impassable barrier to chinook salmon, it is not designated EFH for chinook salmon.

3.4 Effects of Proposed Action on EFH

The effects on Snake River chinook salmon are the same as those for Snake River steelhead and are described in detail in Section 2.2.1 of this document, the proposed actions may result in short-term changes on a variety of habitat parameters. Within the action area, the primary habitat effects are short-term increases in turbidity and cobble embeddedness, and long-term improvements in fish passage and stream channel integrity. These effects would not extend downstream to stream reaches used by chinook salmon.

3.5 Conclusion

NOAA Fisheries concludes that the proposed actions would not affect EFH for Snake River salmon. Since the action area is upstream from a natural impassable barrier to chinook salmon, it is not designated EFH for chinook salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations to Federal agencies regarding actions that may adversely affect EFH. Because the proposed actions do not affect EFH for Snake River chinook salmon, NOAA Fisheries does not recommend any conservation measures for EFH.

3.7 Statutory Response Requirement

Pursuant to the MSA (section 305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. No response is required for these actions.

3.8 Supplemental Consultation

The BLM must reinitiate EFH consultation with NOAA Fisheries if the proposed actions are substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(1)).

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APPENDIX A - SNAKE RIVER STEELHEAD

BIOLOGICAL REQUIREMENTS, CURRENT STATUS, AND TRENDS:

SNAKE RIVER STEELHEAD

1.1 General Life History

Steelhead can be divided into two basic run-types based on the state of sexual maturity at the time of river entry and the duration of the spawning migration (Burgner et al. 1992). The stream-maturing type, or summer steelhead, enters fresh water in a sexually immature condition and requires several months in freshwater to mature and spawn. The ocean-maturing type, or winter steelhead, enters fresh water with well-developed gonads and spawns shortly after river entry (Barnhart 1986). Variations in migration timing exist between populations. Some river basins have both summer and winter steelhead, while others only have one run-type.

In the Pacific Northwest, summer steelhead enter fresh water between May and October (Busby et al. 1996; Nickelson et al. 1992). During summer and fall, prior to spawning, they hold in cool, deep pools (Nickelson et al. 1992). They migrate inland toward spawning areas, overwinter in the larger rivers, resume migration in early spring to natal streams, and then spawn (Meehan and Bjornn 1991; Nickelson et al. 1992). Winter steelhead enter fresh water between November and April (Busby et al. 1996; Nickelson et al. 1992), migrate to spawning areas, and then spawn in late winter or spring. Some adults, however, do not enter coastal streams until spring, just before spawning (Meehan and Bjornn 1991). Difficult field conditions (snowmelt and high stream flows) and the remoteness of spawning grounds contribute to the relative lack of specific information on steelhead spawning.

Steelhead are iteroparous, or capable of spawning more than once before death. However, it is rare for steelhead to spawn more than twice before dying and most that do so are females (Nickelson et al. 1992). Iteroparity is more common among southern steelhead populations than northern populations (Busby et al. 1996). Multiple spawnings for steelhead range from 3 to 20% of runs in Oregon coastal streams.

Steelhead spawn in cool, clear streams containing suitable gravel size, depth, and current velocity. Intermittent streams may also be used for spawning (Barnhart 1986; Everest 1973). Steelhead enter streams and arrive at spawning grounds weeks or even months before they spawn and are vulnerable to disturbance and predation. Cover in the form of overhanging vegetation, undercut banks, submerged vegetation, submerged objects such as logs and rocks, floating debris, deep water, turbulence, and turbidity (Giger 1973) are required to reduce disturbance and predation of spawning steelhead. Summer steelhead usually spawn further upstream than winter steelhead (Withler 1966; Behnke 1992).

Depending on water temperature, steelhead eggs may incubate for 1.5 to 4 months (August 9, 1996, 61 FR 41542) before hatching. Summer rearing takes place primarily in the faster parts of pools, although young-of-the-year are abundant in glides and riffles. Winter rearing occurs more uniformly at lower densities across a wide range of fast and slow habitat types. Productive steelhead habitat is characterized by complexity, primarily in the form of large and small wood. Some older juveniles move downstream to rear in larger tributaries and mainstem rivers (Nickelson et al. 1992).

Juveniles rear in fresh water from 1 to 4 years, then migrate to the ocean as smolts. Winter steelhead populations generally smolt after 2 years in fresh water (Busby et al. 1996). Steelhead typically reside in marine waters for 2 or 3 years prior to returning to their natal stream to spawn at 4 or 5 years of age. Populations in Oregon and California have higher frequencies of age-1-ocean steelhead than populations to the north, but age-2-ocean steelhead generally remain dominant (Busby et al. 1996). Age structure appears to be similar to other west coast steelhead, dominated by 4-year-old spawners (Busby et al. 1996).

Based on purse seine catches, juvenile steelhead tend to migrate directly offshore during their first summer rather than migrating along the coastal belt as do salmon. During fall and winter, juveniles move southward and eastward (Hartt and Dell 1986).

1.2 Population Dynamics and Distribution

The following section provides specific information on the distribution and population structure (size, variability, and trends of the stocks or populations) of the Snake River evolutionary significant unit (ESU). Most of this information comes from observations made in terminal, freshwater areas, which may be distinct from the action area. This focus is appropriate because the species status and distribution can only be measured at this level of detail as adults return to spawn.

The longest consistent indicator of steelhead abundance in the Snake River Basin is based on counts of natural-origin steelhead at the uppermost dam on the lower Snake River (Lower Granite Dam). The abundance of natural-origin summer steelhead at the uppermost dam on the Snake River has declined from a 4-year average of 58,300 in 1964 to an average of 8,300 ending in 1998. In general, steelhead abundance declined sharply in the early 1970s, rebuilt modestly from the mid-1970s through the 1980s, and again declined during the 1990s (Figure 1).

These broad scale trends in the abundance of steelhead were reviewed through the Plan for analyzing and testing hypotheses (PATH) process. The PATH report concluded that the initial, substantial decline coincided with the declining trend in downstream passage survival. However, the more recent decline in abundance, observed over the last decade or more, does not coincide with declining passage survival, but can be at least partially accounted for by a shift in climatic regimes that has affected ocean survival (Marmorek and Peters 1998).

B-run steelhead are distinguished from the A-run component by their unique life history characteristics. B-run steelhead were traditionally distinguished as larger and older, later-timed fish that return primarily to the South Fork Salmon, Middle Fork Salmon, Selway, and Lochsa rivers. The recent All Species Review by the Technical Advisory Committee (TAC) concluded that different populations of steelhead do have different size structures, with populations dominated by larger fish (i.e., greater than 77.5 cm) occurring in the traditionally defined B-run

basins (TAC 1999). Larger fish occur in other populations throughout the basin, but at much lower rates (evidence suggests that fish returning to the Middle Fork Salmon and Little Salmon are intermediate in that they have a more equal distribution of large and small fish).

B-run steelhead are also generally older. A-run steelhead are predominately age-1-ocean fish, whereas most B-run steelhead generally spend two or more years in the ocean prior to spawning. The differences in ocean age are primarily responsible for the differences in the size of A-run and B-run steelhead. However, B-run steelhead are also thought to be larger at the same age than A-run fish. This may be due, in part, to the fact that B-run steelhead leave the ocean later in the year than A-run steelhead and thus have an extra month or more of ocean residence at a time when growth rates are thought to be greatest.

Historically, a distinctly bimodal pattern of freshwater entry could be used to distinguish A-run and B-run fish. A-run steelhead were presumed to cross Bonneville Dam from June to late August whereas B-run steelhead enter from late August to October. The TAC reviewed the available information on timing and confirmed that the majority of large fish do still have a later timing at Bonneville; 70% of the larger fish crossed the dam after August 26, the traditional cutoff date for separating A-run and B-run fish (TAC 1999). However, the timing of the early part of the A-run has shifted somewhat later, thereby reducing the timing separation that was so apparent in the 1960s and 1970s. The timing of the larger, natural-origin B-run fish has not changed.

The abundance of A-run versus B-run components of Snake River Basin steelhead can be distinguished in data collected since 1985. Both components have declined through the 1990s, but the decline of B-run steelhead has been more significant. The 4-year average counts at Lower Granite Dam declined from 18,700 to 7,400 beginning in 1985 for A-run steelhead and from 5,100 to 900 for B-run steelhead. Counts over the last 5 or 6 years have been stable for A-run steelhead and without significant trend (Figure 2). Counts for B-run steelhead have been low and highly variable, but also without apparent trend (Figure 3).

Comparison of recent dam counts with escapement objectives provides perspective regarding the status of the ESU. The management objective for Snake River steelhead stated in the Columbia River Fisheries Management Plan was to return 30,000 natural/wild steelhead to Lower Granite Dam. The All Species Review (TAC 1997) further clarified that this objective was subdivided into 20,000 A-run and 10,000 B-run steelhead. Idaho has reevaluated these escapement objectives using estimates of juvenile production capacity. This alternative methodology lead to revised estimates of 22,000 for A-run and 31,400 for B-run steelhead (pers. comm., S. Keifer, Idaho Department of Fish and Game with P. Dygert, NOAA National Marine Fisheries Service).

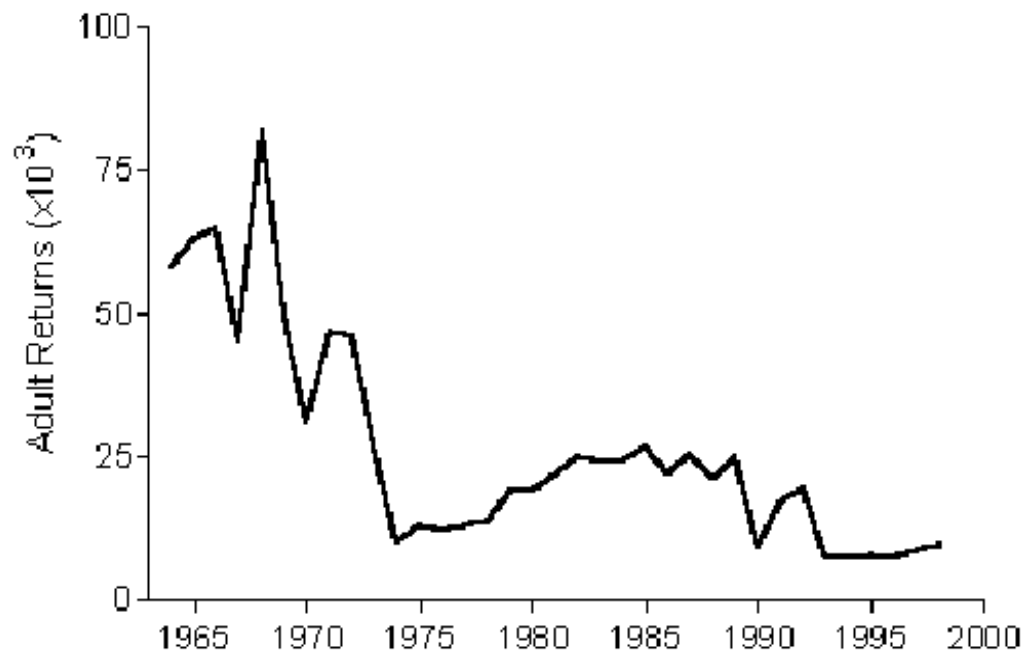
The State of Idaho has conducted redd count surveys in all of the major subbasins since 1990. Although the surveys are not intended to quantify adult escapement, they can be used as indicators of relative trends. The sum of redd counts in natural-origin B-run production

subbasins declined from 467 in 1990 to 59 in 1998 (Figure 4). The declines are evident in all four of the primary B-run production areas. Index counts in the natural-origin A-run production areas have not been conducted with enough consistency to permit similar characterization.

Idaho has also conducted surveys for juvenile abundance in index areas throughout the Snake River Basin since 1985. Parr densities of A-run steelhead have declined from an average of about 75% of carrying capacity in 1985 to an average of about 35% in recent years through 1995 (Figure 5). Further declines were observed in 1996 and 1997. Parr densities of B-run steelhead have been low, but relatively stable since 1985, averaging 10% to 15% of carrying capacity through 1995. Parr densities in B-run tributaries declined further in 1996 and 1997 to 11% and 8%, respectively.

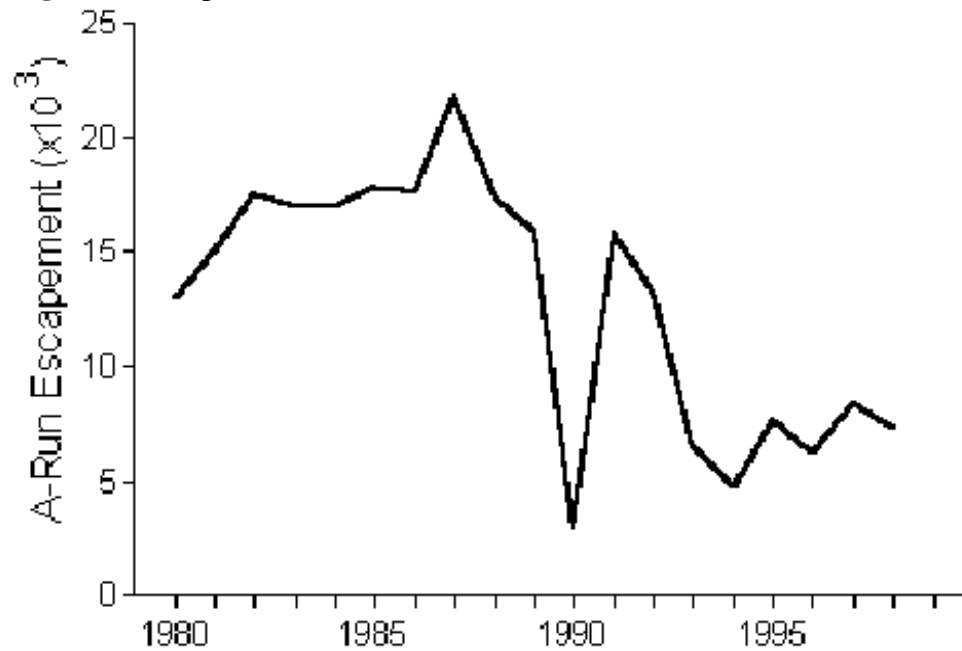
It is apparent from the available data that B-run steelhead are much more depressed than the A-run component. In evaluating the status of the Snake River Basin steelhead ESU, it is pertinent to consider if B-run steelhead represent a "significant portion" of the ESU. This is particularly relevant because the Tribes have proposed to manage the Snake River Basin steelhead ESU as a whole without distinguishing between components, and further, that it is inconsistent with NOAA's National Marine Fisheries Service (NOAA Fisheries) authority to manage for components of an ESU.

Figure 1. Adult Returns of Wild Summer Steelhead to Lower Granite Dam on the Snake River.



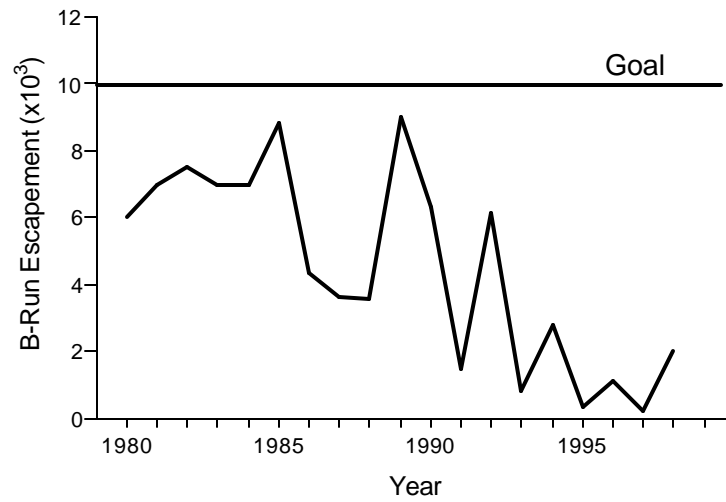
Source: Escapement through 1995 from TAC (1997); escapement for 1996–1998 from pers. comm. G. Mauser (IDFG).

Figure 2. Escapement of A-Run Snake River Steelhead to Lower Granite Dam.



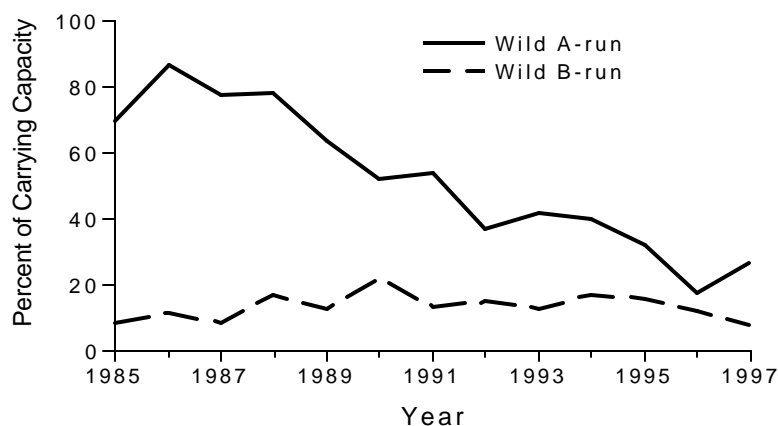
Source: Data for 1980 through 1984 from Figures 1 and 2 of Section 8 in TAC (1997). Data for 1985 through 1998 from Table 2 of Section 8 (TAC 1997) and pers. comm. G. Mauser, (IDFG).

Figure 3. Escapement of B-Run Snake River Steelhead to Lower Granite Dam.



Source: Data for 1980 through 1984 from Figures 1 and 2 of Section 8 in TAC (1997). Data for 1985 through 1998 from Table 2 of Section 8 (TAC 1997) and pers. comm. G. Mauser (IDFG).

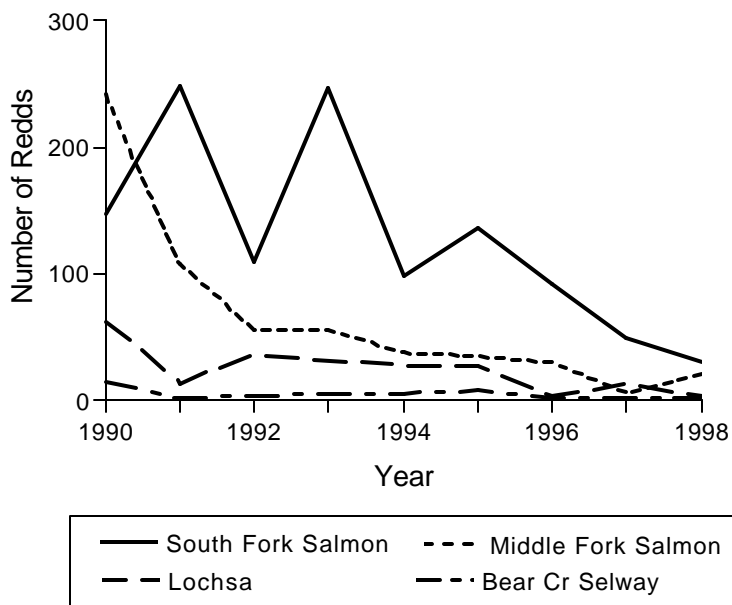
Figure 4. Redd Counts for Wild Snake River (B-Run) Steelhead in the South Fork and Middle Fork Salmon, Lochsa, and Bear Creek-Selway Index Areas.



Data for the Lochsa exclude Fish Creek and Crooked Fork.

Sources: memo from T. Holubetz (IDFG), "1997 Steelhead Redd Counts", dated May 16, 1997, and IDFG (unpublished).

Figure 5. Estimated Carrying Capacity for Juvenile (Age-1+ and -2+) Wild A-Run and B-Run Steelhead in Idaho Streams



Source: Data for 1985 through 1996 from (Hall-Griswold and Petrosky 1998); data for 1997 from IDFG (unpublished).

It is first relevant to put the Snake River basin into context. The Snake River historically supported over 55% of total natural-origin production of steelhead in the Columbia River Basin and now has approximately 63% of the basin's natural production potential (Mealy 1997). B-run steelhead occupy four major subbasins including two on the Clearwater River (Lochsa and Selway) and two on the Salmon River (Middle Fork and South Fork Salmon), areas that for the most part are not occupied by A-run steelhead. Some natural B-run steelhead are also produced in parts of the mainstem Clearwater and its major tributaries. There are alternative escapement objectives for B-run steelhead of 10,000 (TAC 1997) and 31,400 (Idaho). B-run steelhead, therefore, represent at least 1/3 and as much as 3/5 of the production capacity of the ESU.

As pointed out above, the geographic distribution of B-run steelhead is restricted to particular watersheds within the Snake River Basin (areas of the mainstem Clearwater, Selway, and Lochsa Rivers and the South and Middle Forks of the Salmon River). No recent genetic data are available for steelhead populations in South and Middle Forks of the Salmon River. The Dworshak National Fish Hatchery (NFH) stock and natural populations in the Selway and Lochsa Rivers are thus far the most genetically distinct populations of steelhead in the Snake River Basin (Waples et al. 1993). In addition, the Selway and Lochsa River populations from the Middle Fork Clearwater appear to be very similar to each other genetically, and naturally produced rainbow trout from the North Fork Clearwater River (above Dworshak Reservoir) clearly show an ancestral genetic similarity to Dworshak NFH steelhead. The existing genetic data, the restricted geographic distribution of B-run steelhead in the Snake (Columbia) River Basin, and the unique life history attributes of these fish (i.e. larger, older adults with a later distribution of run timing compared to A-run steelhead in other portions of the Columbia River Basin) clearly support the conservation of B-run steelhead as a biologically significant component of the Snake River ESU.

Another approach to assessing the status of an ESU being developed by NOAA Fisheries is to consider the status of its component populations. For this purpose a population is defined as a group of fish of the same species spawning in a particular lake or stream (or portion thereof) at a particular season, which to a substantial degree do not interbreed with fish from any other group spawning in a different place or in the same place at a different season. Because populations as defined here are relatively isolated, it is biologically meaningful to evaluate the risk of extinction of one population independently from any other. Some ESUs may be comprised of only one population whereas others will be constituted by many. The background and guidelines related to the assessment of the status of populations is described in a recent draft report discussing the concept of viable salmonid populations (McElhany et al. 2000).

The task of identifying populations within an ESU will require making judgements based on the available information. Information regarding the geography, ecology, and genetics of the ESU are relevant to this determination. Although NOAA Fisheries has not compiled and formally reviewed all the available information for this purpose, it is reasonable to conclude that, at a minimum, each of the major subbasins in the ESU represent a population within the context of this discussion. A-run populations

would therefore include at least the tributaries to the lower Clearwater, the upper Salmon River and its tributaries, the lower Salmon River and its tributaries, the Grand Ronde, Imnaha, and possibly the Snake River mainstem tributaries below Hells Canyon Dam. B-run populations would be identified in the Middle Fork and South Fork Salmon Rivers and the Lochsa and Selway Rivers (major tributaries of the upper Clearwater), and possibly in the mainstem Clearwater River, as well. These basins are, for the most part, large geographical areas and it is quite possible that there is additional population structure within at least some of these basins. However, because that hypothesis has not been confirmed, NOAA Fisheries assumes that there are at least five populations of A-run steelhead and five populations of B-run steelhead in the Snake River basin ESU. Escapement objectives for A and B-run production areas in Idaho, based on estimates of smolt production capacity, are shown in Table 1.

Table 1. Adult Steelhead Escapement Objectives Based on Estimates of 70% Smolt Production Capacity

A-Run Production Areas		B-Run Production Areas	
Upper Salmon	13,570	Middle Fork Salmon	9,800
Lower Salmon	6,300	South Fork Salmon	5,100
Clearwater	2,100	Lochsa	5,000
Grand Ronde	(1)	Selway	7,500
Imnaha	(1)	Clearwater	4,000
Total	21,970	Total	31,400

Note: comparable estimates are not available for populations in Oregon and Washington subbasins.

1.2.1 Lower Snake River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the Lower Snake River is summarized from the Lower Snake River Subbasin Biological Assessment (Bureau of Land Management [BLM] 2000a), except where noted.

1.2.1.1 Species Distribution:

Within the Lower Snake River Subbasin steelhead use occurs in most of the accessible streams when stream conditions are suitable. Steelhead use the mainstem Snake River for upstream and downstream passage. A limited amount of juvenile rearing and overwintering by adults occurs in the Snake River. Most accessible tributaries are used by steelhead for spawning and rearing. The larger streams used for spawning and rearing include Asotin, Tenmile, Couse, Captain John, Jim, and Cook Creeks. Other smaller tributary streams with limited rainbow/steelhead use include Tammany, Tenmile, Corral, Cache, Cottonwood, and Cherry Creeks.

1.2.1.2 Location of Important Spawning and Rearing Areas:

Asotin Creek, followed by Captain John, Tenmile, and Couse Creeks have the highest potential for steelhead production within the subbasin. Priority watersheds include Asotin and Captain John Creeks.

1.2.1.3 Conditions and Trends of Populations:

Despite their relatively broad distribution, very few healthy steelhead populations exist (Quigley and Arbelbide 1997). Recent status evaluations suggest many steelhead stocks are depressed. A recent multi-agency review showed that total escapement of salmon and steelhead to the various Columbia River regions has been in decline since 1986 (Anderson et al. 1996). Existing steelhead stocks consist of four main types: wild, natural (non-indigenous progeny spawning naturally), hatchery, and mixes of natural and hatchery fish. Production of wild anadromous fish in the Columbia River Basin has declined about 95% from historical levels (Huntington et al. 1994). Most existing steelhead production is supported by hatchery and natural fish as a result of large-scale hatchery mitigation production programs. Wild, indigenous fish, unaltered by hatchery stocks, are rare and present in only 10% of the historical range and 25% of the existing range. Remaining wild stocks are concentrated in the Salmon and Selway (Clearwater Basin) rivers in central Idaho and the John Day River in Oregon. Although few wild stocks were classified as strong, the only subwatersheds classified as strong were those sustaining wild stocks.

1.2.2 Clearwater River, North Fork Clearwater River, and Middle Fork Clearwater River Subbasins

Information on steelhead distribution, important watersheds, and conditions and trends in the Clearwater River is summarized from the Clearwater River, North Fork Clearwater River and Middle Fork Clearwater River Subbasins Biological Assessment (BA) (BLM 2000b), except where noted.

1.2.2.1 Species Distribution:

Within the Clearwater River Subbasin steelhead use is widespread and most accessible tributaries are used year-long or seasonally. In the Clearwater River drainage, the primary steelhead producing streams include: Potlatch River; Lapwai, Big Canyon, Little Canyon, Lolo, and Lawyer Creeks. Other Clearwater River mainstem tributary streams providing spawning and/or rearing habitat for steelhead include Lindsay, Hatwai, Lapwai, Catholic, Cottonwood, Pine, Bedrock, Jacks, Big Canyon, Orofino, Jim Ford, Big, Fivemile, Sixmile, and Tom Taha Creeks. Some of these streams provide sub-optimal spawning and rearing habitat because of steep stream gradients, barriers, low flows, limited spawning gravels, and small size of tributaries.

In the 1969 the United States Army Corps of Engineers finished construction of Dworshak Dam on the North Fork Clearwater River, which totally blocked access to anadromous fish. To mitigate for the steelhead losses resulting from the dam, Dworshak NFH was constructed in 1969. Wild B-run steelhead are collected at the base of the dam and used as the brood stock for Dworshak NFH. Since 1992, steelhead eggs collected at Dworshak NFH have been shipped as eyed eggs to the Clearwater Fish Hatchery, located at the confluence of the North Fork Clearwater River and the Clearwater River, for incubation and rearing. Three satellite facilities are associated with the Clearwater Fish Hatchery: Crooked River, Red River, and Powell. The Kooskia NFH is located on Clear Creek, a tributary to the Middle Fork Clearwater River.

1.2.2.2 Location of Important Spawning and Rearing Areas:

The only watershed identified as a special emphasis or priority watershed for steelhead in the Clearwater River Subbasin is Lolo Creek.

1.2.2.3 Conditions and Trends of Populations:

Refer to “Conditions and Trends of Populations” under Lower Snake River Subbasin above.

1.2.3 South Fork Clearwater River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the South Fork Clearwater River is summarized from the Draft Clearwater Subbasin Assessment (CPAG 2001), except where noted.

1.2.3.1 Species Distribution:

Within the South Fork Clearwater River Subbasin, steelhead use is widespread, and most accessible tributaries are used year-long or seasonally. In the South Fork drainage, the primary steelhead producing drainages include Newsome Creek, American River, Red River, and Crooked River. Other South Fork Clearwater River mainstem tributary streams providing spawning and/or rearing habitat for steelhead include Tenmile, Johns, Meadow, and Mill Creeks (Jody Brostrom, Idaho Department of Fish and Game, pers. comm. March 30, 2001). Low order streams and accessible headwater portions of high order streams provide early rearing habitat (Nez Perce National Forest 1998).

1.2.3.2 Location of Important Spawning and Rearing Areas:

Important spawning habitat in the South Fork Clearwater occurs primarily in Newsome Creek, American River, Red River, and Crooked River.

1.2.3.3 Conditions and Trends of Populations:

The South Fork Clearwater River may have historically maintained a genetically unique stock of steelhead, but hatchery supplementation has since clouded the lines of genetic distinction between stocks (Nez Perce National Forest 1998). Robin Waples (In a letter to S. Kiefer, Idaho Department of Fish and Game, August 25, 1998) found that steelhead in Johns and Tenmile Creeks are genetically most similar to fish originating from the Selway River system, suggesting that some genetic difference may have existed historically within the South Fork Clearwater drainage. A statewide genetic analysis is currently being conducted using DNA markers, and may provide more information on past and current genetic distinctions between steelhead stocks in the Clearwater subbasin (Byrne 2001).

1.2.4 Selway River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the Selway River is summarized from the Lower Selway Biological Assessment (USFS 1999a), the Biological Opinion on Culvert Replacements on Lolo Creek and Lochsa River [National Marine Fisheries Service (NMFS) 2002a], and the Biological Opinion on Recreational Suction Dredge Mining in Lolo Creek (NOAA Fisheries 2003), except where noted.

1.2.4.1 Species Distribution:

High numbers of juvenile steelhead have been documented in all of the fifth code watersheds above the Selway-Bitterroot wilderness boundary. In addition, Meadow and Gedney Creeks also support high numbers of both steelhead and resident rainbow trout. Densities of steelhead are less in O'hara, Swiftwater, Goddard, and Falls Creeks (USFS unpublished data 1990 - 1998). Densities in Nineteenmile, Rackliffe, Boyd, and Glover Creeks are limited by small size and accessibility although the species is present. Spawning habitat for steelhead has been documented in most of the surveyed tributaries, including small third order streams such as Renshaw and Pinchot Creeks. In the Selway River, stream survey data and casual observations suggest that the steelhead/rainbow population in the larger tributaries, i.e. Meadow and Moose Creeks, are composed of a significant resident rainbow/redband component (USFS unpublished data 1996, 1997). Survey data and observations revealed the presence of large number of rainbow trout greater than 220 mm, especially in North Moose Creek. In addition, observations suggest the presence of two distinct forms of this species.

Steelhead and rainbow of all sizes differed phenotypically; there appeared to be a distinct "steelhead" presmolt form, which was more bullet-shaped and silvery in color, and a distinct "trout" form, which was less bullet-shaped, retained parr marks at larger sizes, and exhibited coloration and spotting more typical of other inland rainbow populations. It is possible that resident rainbow trout and steelhead are reproductively isolated, which may have resulted in genetic divergence. Analysis of the genetic composition of the Moose Creek population may be attempted in future years.

1.2.4.2 Location of Important Spawning and Rearing Areas:

The most important spawning and rearing areas for steelhead are located in the larger tributaries, such as Meadow, Moose, Gedney, Three Links, Marten, Bear, Whitecap, Running, Ditch, Deep, and Wilkerson Creeks. Moose Creek may support the most significant spawning and rearing habitat for steelhead of any of these tributaries.

1.2.4.3 Conditions and Trends of Populations:

The Selway River drainage (along with the Lochsa and lower Clearwater River tributary systems) is one of the only drainages in the Clearwater Subbasin where steelhead populations have little or no hatchery influence (Busby et al. 1996; IDFG 2001). The USFS (1999a) identified the Lochsa and Selway River systems as refugia areas for steelhead based on location, accessibility, habitat quality, and number of roadless tributaries. The Idaho Department of Fish and Game (IDFG) estimates that approximately 80% of the wild steelhead in the Clearwater River Subbasin are destined for the Lochsa River and Selway River drainages. The Clearwater River Basin produces the majority of B-run steelhead in the Snake River ESU, and most of the Clearwater steelhead are produced in the Lochsa River Subbasin. The Lochsa River Subbasin has the highest observed densities of age 1+ B-run steelhead parr, and the highest percent carrying capacity (IDFG 1999). Hatchery steelhead were used to supplement natural populations in the Lochsa River drainage before 1982, but current management does not include any hatchery supplementation. Current adult returns are considered to be almost entirely wild steelhead progeny.

1.2.5 Lochsa River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the Lochsa River is summarized from the Biological Opinion on Culvert Replacements on Lolo Creek and Lochsa River (NMFS Fisheries 2002a) and the Biological Opinion on Recreational Suction Dredge Mining in Lolo Creek (NOAA Fisheries 2003), except where noted.

1.2.5.1 Species Distribution:

Adult Snake River steelhead are present in the upper mainstem Clearwater River in September and October, and in the upper mainstem and Middle Fork Clearwater Rivers in the winter. Spawning and incubation occurs in streams such as the Lochsa River from March through July. Steelhead juveniles then typically rear for two to three years in the tributaries and larger rivers before beginning a seaward migration during February through May.

1.2.5.2 Location of Important Spawning and Rearing Areas:

Steelhead have been observed in most of the larger tributaries to the Lochsa River, with high steelhead productivity occurring in Fish, Boulder, Deadman, Pete King, and Hungry Creeks (USFS 1999b).

1.2.5.3 Conditions and Trends of Populations:

Refer to “Conditions and Trend of Populations” under Selway River Subbasin above.

1.2.6 Lower Salmon River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the Lower Salmon River is summarized from the Lower Salmon River Subbasin Biological Assessment (BLM 2000c).

1.2.6.1 Species Distribution:

Within the Lower Salmon River Subbasin, steelhead use occurs in most of the accessible streams when stream conditions are suitable. Steelhead use the mainstem Salmon River for upstream and downstream passage. A limited amount of juvenile rearing and adult overwintering may occur in the Salmon River. Most accessible tributaries are used by steelhead for spawning and rearing. The larger streams used for spawning and rearing include China, Eagle, Deer, Cottonwood, Maloney, Deep, Rice, Rock, White Bird, Skookumchuck, Slate, John Day, Race, Lake, Allison, Partridge, Elkhorn, and French Creeks. Other smaller tributary streams with limited rainbow/steelhead use include Flynn, Wapshilla, Billy, Burnt, Round Springs, Telcher, Deer, McKinzie, Christie, Sherwin, China, Cow, Fiddle, Warm Springs, Van, and Robbins Creeks.

1.2.6.2 Location of Important Spawning and Rearing Areas:

Slate Creek, followed by White Bird Creek, has the highest potential for steelhead production within the subbasin. Priority watersheds identified for steelhead include China, Eagle, Deer, White Bird, Skookumchuck, Slate, John Day, Race, Allison, Partridge, and French Creeks. Other streams which are important for spawning and rearing include Cottonwood, Maloney, Deep, Rice, Rock, Lake, and Elkhorn Creeks.

1.2.6.3 Conditions and Trends of Populations:

The Bureau of Land Management (BLM) noted that current numbers of naturally spawning steelhead in the Salmon River Subbasin are at all time lows, and overall trend is downward. Adult steelhead were commonly observed in most larger tributaries during the 1970s through 1980s, but now such observations have significantly declined (BLM 2000c).

The Nez Perce National Forest conducted an ecosystem analysis at the watershed scale for Slate Creek (USFS 2000) and concluded that the distribution of fish species assessed is relatively consistent with historic distribution. Steelhead populations are thought to have experienced a great decline from historic levels although the data to describe the extent of this reduction is not available (USFS 2000). The BLM has conducted trend monitoring of fish populations in lower Partridge Creek and French Creek. Partridge Creek densities of age 0 rainbow/steelhead in 1988 were 0.30 fish/m² and age 1 rainbow/steelhead densities were 0.19 fish/m². In 1997, age 0 densities were 0.003 fish/m² and age 1 densities were 0.01 fish/m². French Creek densities of age 0 rainbow/steelhead in 1991 were 0.07 fish/m² and age 1 rainbow/steelhead densities were 0.07 fish/m². In 1997, age 0 densities were 0.0075 fish/m² and age 1 densities were 0.02 fish/m². Densities of steelhead have significantly declined from the 1980s through the late 1990s.

1.2.7 Little Salmon River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the Little Salmon River is summarized from the Little Salmon River Subbasin Biological Assessment (BLM 2000d), except where noted.

1.2.7.1 Species Distribution:

Within the Little Salmon River Subbasin, steelhead use occurs in the lower portion of the subbasin and tributaries, downstream from barriers located at river mile (RM) 21 in the Little Salmon River. No recent or historic documentation exists for steelhead using streams above

RM 24 in the Little Salmon River. Welsh et al. (1965) reports that no known passage by salmon or steelhead exists above the Little Salmon River falls. Ineffectual fish passage facilities were constructed at the falls by the Civilian Conservation Corps during the 1930s (Welsh et al. 1965). Streams and rivers providing important spawning and rearing for steelhead include Little Salmon and River Rapid Rivers, and Boulder, Hazard, and Hard Creeks. Other Little Salmon River mainstem tributary streams providing spawning and rearing habitat include Squaw, Sheep, Hat, Denny, Lockwood, Rattlesnake, Elk, and Trail Creeks. Adult steelhead have been documented in these streams. Primary steelhead use of these streams is often associated with the mouth area or a small stream segment or lower reach, before steep gradients/cascades or a barrier restricts upstream fish passage. These streams generally provide sub-optimal spawning and rearing habitat because of steep stream gradients, barriers, low flows, limited spawning gravels, and small size of tributaries.

1.2.7.2 Location of Important Spawning and Rearing Areas:

Priority watersheds for steelhead include Rapid River, Boulder, Hazard, and Hard Creeks. These streams provide important spawning and rearing habitat for steelhead. Rapid River is a stronghold and key refugia area for steelhead.

1.2.7.3 Conditions and Trends of Populations:

The BLM noted that current numbers of naturally spawning steelhead in the Little Salmon River Subbasin are at all-time lows, and overall trend is downward. The highest number of adult natural spawning steelhead counted at the Rapid River weir was 162 in 1993, and the lowest counted was 10 in 1999 (BLM 2000d).

1.2.8 Middle Salmon River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the Middle Salmon River is summarized from the Middle Salmon River and South Fork Salmon River Subbasins Biological Assessment (BLM 2000e), except where noted.

1.2.8.1 Species Distribution:

Within the Middle Salmon River Subbasin, steelhead use the mainstem Salmon River for upstream and downstream passage. A limited amount of juvenile rearing and adult overwintering may occur in the Middle Salmon River. Most accessible tributaries are used by steelhead for spawning and rearing. Key steelhead spawning and rearing is probably occurring in

Crooked, Bargamin and Sabe Creeks and the lower Wind River on the north side of the Salmon River and California, Warren, Chamberlain, and Horse Creeks on the south side of the Salmon River.

1.2.8.2 Location of Important Spawning and Rearing Areas:

Priority watersheds for steelhead include Warren and California Creeks. Steelhead use Warren Creek for spawning and rearing habitat. No fish passage barriers exist for steelhead within the drainage. Steelhead were found in Richardson, Stratton, Steamboat, and Slaughter Creeks (Raleigh 1995). Most other tributaries were surveyed, but no steelhead were found. Because of habitat alterations from past mining (e.g., in-channel dredging, piling of dredged material adjacent to streams) and limited suitable habitat, steelhead use of the upper portion of the Warren Creek subwatershed is limited. Carey and Bear Creeks provide habitat in the lower reaches.

1.2.8.3 Conditions and Trend of Populations: Refer to “Conditions and Trends of Populations” under Lower Salmon River Subbasin above.

1.2.9 South Fork Salmon River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the South Fork Salmon River is summarized from the Middle Salmon River and South Fork Salmon River Subbasins Biological Assessment (BLM 2000e), except where noted.

1.2.9.1 Species Distribution:

Steelhead have been documented in the South Fork Salmon River and lower portions of its major tributaries. Most of the mainstem spawning occurs between the East Fork Salmon River and Cabin Creek. Principle spawning areas are located near Stolle Meadows, from Knox Bridge to Penny Spring, Poverty Flat, Darling cabins, the Oxbow, and from 22 Hole to Glory Hole (USFS 1998).

1.2.9.2 Location of Important Spawning and Rearing Areas:

Primary spawning tributaries in the South Fork Salmon River Subbasin are Burntlog, Lick, Lake, and Johnson Creeks, the East Fork South Fork Salmon and Secesh Rivers (USFS 1998).

1.2.9.3 Conditions and Trends of Populations:

Refer to “Conditions and Trends of Populations” under Lower Salmon River Subbasin above.

1.2.10. Upper Salmon River Subbasin

Information on steelhead distribution, important watersheds, and conditions and trends in the Upper Salmon River is summarized from the Biological Opinion on Effects of 2002 Herbicide Treatment of Noxious Weeds on Lands Administered by the Salmon-Challis National Forest (NMFS 2002b).

1.2.10.1 Species Distribution:

Steelhead in the Upper Salmon River subbasin occur in most of the accessible streams when stream conditions are suitable. Steelhead use the mainstem for upstream and downstream passage. A limited amount of juvenile rearing and adult overwintering occurs in the Upper Salmon River. Most accessible tributaries are used for spawning and rearing.

1.2.10.2 Location of Important Spawning and Rearing Areas:

Key steelhead spawning and rearing probably occurs in Morgan, Thompson and Panther Creeks, in addition to the Yankee Fork Salmon, Pahsimeroi, North Fork Salmon, East Fork Salmon, and Lemhi Rivers.

1.2.10.3 Conditions and Trends of Populations:

Refer to “Conditions and Trends of Populations” under Lower Salmon River Subbasin above.

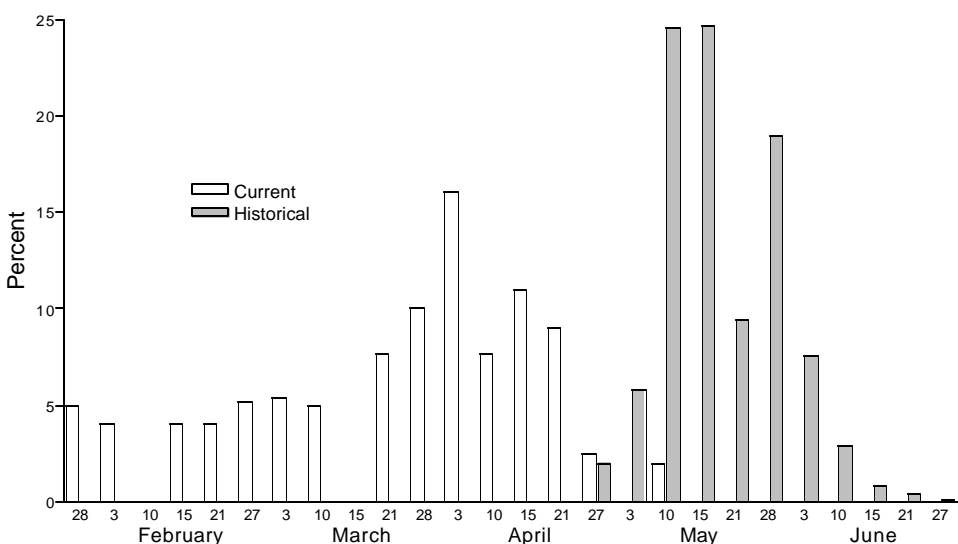
1.3 Hatchery Populations

Hatchery populations, if genetically similar to their natural-origin counterparts, provide a hedge against extinction of the ESU or of the gene pool. The Imnaha and Oxbow hatcheries produce A-run stocks that are currently included in the Snake River basin steelhead ESU. The Pahsimeroi and Wallowa hatchery stocks may also be appropriate and available for use in developing supplementation programs; NOAA Fisheries required in its recent biological opinion on Columbia basin hatchery operations that this program begin to transition to a local-origin broodstock to provide a source for future supplementation efforts in the lower Salmon River (NMFS 1999). Although other stocks

provide more immediate opportunities to initiate supplementation programs within some subbasins, it may also be necessary and desirable to develop additional broodstocks that can be used for supplementation in other natural production areas. Despite uncertainties related to the likelihood that supplementation programs can accelerate the recovery of naturally spawning populations, these hatchery stocks provide a safeguard against the further decline of natural-origin populations.

The Dworshak NFH is unique in the Snake River Basin in producing a B-run hatchery stock. The Dworshak stock was developed from natural-origin steelhead from the North Fork Clearwater River, is largely free of other hatchery introductions, and was therefore included in the ESU, although not as part of the listed population. However, past hatchery practices and possibly changes in flow and temperature conditions related to Dworshak Dam have lead to substantial divergence in spawn timing of the hatchery stock compared to historical timing in the North Fork Clearwater River, and compared to natural-origin populations in other parts of the Clearwater Basin. Because the spawn timing of the hatchery stock is much earlier than historically (Figure 6), the success of supplementation efforts using these stocks may be limited. In fact, past supplementation efforts in the South Fork Clearwater River using Dworshak NFH stock have been largely unsuccessful, although improvements in out-planting practices have the potential to yield different results.

Figure 6. Historical Versus Current Spawn-Timing of Steelhead at Dworshak Hatchery.



In addition, the unique genetic character of Dworshak NFH steelhead will limit the degree to which the stock can be used for supplementation in other parts of the Clearwater Subbasin, and particularly in the Salmon River B-run basins. Supplementation efforts in those areas, if undertaken, will more likely have to rely on the future development of local broodstocks. Supplementation opportunities in many of the B-run production areas may be limited because of logistical difficulties associated with high mountain,

wilderness areas. Because opportunities to accelerate the recovery of B-run steelhead through supplementation, even if successful, are expected to be limited, it is essential to maximize the escapement of natural-origin steelhead in the near term.

1.4 Conclusion

Finally, the conclusion and recommendations of the TAC's All Species Review (TAC 1997) are pertinent to this status review of Snake River steelhead. Considering information available through 1996, the 1997 All Species Review stated:

“Regardless of assessment methods for A and B steelhead, it is apparent that the primary goal of enhancing the upriver summer steelhead run is not being achieved. The status of upriver summer steelhead, particularly natural-origin fish, has become a serious concern. Recent declines in all stocks, across all measures of abundance, are disturbing.”

“There has been no progress toward rebuilding upriver runs since 1987. Throughout the Columbia River basin, dam counts, weir counts, spawning surveys, and rearing densities indicate natural-origin steelhead abundance is declining, culminating in the proposed listing of upriver stocks in 1996. Escapements have reached critically low levels despite the relatively high productivity of natural and hatchery rearing environments. Improved flows and ocean conditions should increase smolt-adult survival rates for upriver summer steelhead. However, reduced returns in recent years are likely to produce fewer progeny and lead to continued low abundance.”

“Although steelhead escapements would have increased (some years substantially) in the absence of mainstem fisheries, data analyzed by the TAC indicate that effects other than mainstem Columbia River fishery harvest are primarily responsible for the currently depressed status and the long term health and productivity of wild steelhead populations in the Columbia River.”

“Though harvest is not the primary cause of declining summer steelhead stocks, and harvest rates have been below guidelines, harvest has further reduced escapements. Prior to 1990, the aggregate of upriver summer steelhead in the mainstem Columbia River appears at times to have led to the failure to achieve escapement goals at Lower Granite Dam. Wild Group B steelhead are presently

more sensitive to harvest than other salmon stocks, including the rest of the steelhead run, due to their depressed status and because they are caught at higher rates in the Zone 6 fishery.”

Small or isolated populations are much more susceptible to stochastic events such as drought and poor ocean conditions. Harvest can further increase the susceptibility of such populations. The Columbia River Fish Management Plan (TAC 1997) recognizes that harvest management must be responsive to run size and escapement needs to protect these populations. The parties should ensure that TAC 1997 harvest guidelines are sufficiently protective of weak stocks and hatchery broodstock requirements.

For the Snake River steelhead ESU as a whole, the median population growth rate (λ) from years 1980-1997, ranges from 0.699 to 0.978, depending on the assumed number of hatchery fish reproducing in the river (Table 2). NOAA Fisheries estimated the risk of absolute extinction for A- and B-runs, based on assumptions of complete hatchery spawning success, and no hatchery spawning success. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years is 0.01 for A-run steelhead and 0.93 for B-run fish. At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years is 1.00 for both runs.

Table 2. Annual rate of population change (λ) in Snake River steelhead, absolute risk of extinction (1 fish/generation), and risk of 90% decline in 24 and 100 years for the period 1980-1997[†]. The range of reported values assumes that hatchery-origin fish either do not contribute to natural production or are as productive as natural-origin spawners.

Model Assumptions	l	Risk of Extinction		Probability of 90% decrease in stock abundance	
		24 years	100 years	24 years	100 years
No Correction for Hatchery Fish	0.978	A-Run 0.000 B-Run 0.000	A-Run 0.000 B-Run 0.000	A-Run 0.000 B-Run 0.060 Aggregate 0.000	A-Run 0.000 B-Run 0.520 Aggregate 0.434
No Instream Hatchery Reproduction	0.910	A-Run 0.000 B-Run 0.000	A-Run 0.010 B-Run 0.093	A-Run 0.200 B-Run 0.730 Aggregate 0.476	A-Run 1.000 B-Run 1.000 Aggregate 1.000
Instream Hatchery Reproduction = Natural Reproduction	0.699	A-Run 0.000 B-Run 0.000	A-Run 1.000 B-Run 1.000	A-Run 1.000 B-Run 1.000 Aggregate 1.000	A-Run 1.000 B-Run 1.000 Aggregate 1.000
[†] From Table B-2a and B-2b. Cumulative Risk Initiative. September 5, 2000, revised appendix B (McClure et al. 2000).					

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